



National Research Council
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Special Interest Group for Dynamic Evaluation of Roofing Systems (SIGDERS) Phase IV

SIGDERS: On Nov. 16, 1994, members of the roofing community met at the National Research Council of Canada and formed a group with a common focus of evaluating roofing systems under dynamic environment. Thus, a *Special Interest Group for Dynamic Evaluation of Roofing Systems* (SIGDERS) was created. The mandate of SIGDERS joint research program is to carry out generic, pre-competitive research of benefit to all its members. During Phases 1, 2 and 3 objectives were identified; tasks were developed and executed through approval process by the Steering Committee members. For each Phase, deliverables were presented to the members via six formal technical meetings and fulfilled all established tasks.

Phase IV overall work plan: SIGDERS Phase III, meeting 6 was held on December 3 - 4, 2002 at the Metro Convention Centre, Toronto, Canada together with Construct Canada Trade Show. Existing and new members participated in a discussion forum – *Where we go from here?* Based on the participated members inputs, a road map for the SIGDERS Phase IV program was conceived. For discussion purposes, a framework of the involved tasks were identified and presented to the members during the Ottawa summer meeting (May 21-22, 2003). Each voting members distributed 100 points against a maximum of THREE objectives. Based on this process, (shown in Table 1), Objectives 1, 3 and 5 were ranked for the execution of the Phase IV operation.

Influence of steel deck parameters on the wind uplift resistance of mechanically attached roofs

1. Quantify physical and mechanical properties of the three different steel decks commonly used in roofing.
2. By selecting three different common fasteners, evaluate pull out resistance with the respective decks.
3. For systems with thermoplastic or thermoset or mod bit membranes quantify wind uplift resistance on these different decks.
4. Identify the influence of deck types for the variation in deck spans (6', 8' and 10').
5. For variation in the deck attachment (screws vs. weld), quantify the difference in wind uplift resistance.

Test procedure to quantify air leakage rate of mechanically attached roofs

1. Prepare state of the art report on the existing air leakage measurement methods.
2. Collect and report the existing air permeability data for common roofing materials/components.
3. Draft a test procedure to quantify the air leakage rate of roof assemblies.
4. Perform trial runs to quantify air leakage rate of systems without air/vapor barrier (retarder).
5. Perform trial runs to quantify air leakage rate of systems with air/vapor barrier (retarder).

Develop correlation for the wind uplift resistance of field/perimeter/corner zones

1. Using NBC, develop load correlation for field/perimeter/corner zones.
2. Using ASCE, develop load correlation for field/perimeter/corner zones.
3. Quantify resistance for mockups with perimeter membrane layout and fastener density.
4. Quantify resistance for mockups with corner membrane layout and fastener density.
5. Correlate load requirement with the system resistance.

Membership: To become a voting member of SIGDERS, an annual membership fee of \$7,000 Canadian Funds and commitment of two years (\$14,000) was established. For the following existing members, contract agreements can remain same as before.

- **Manufacturers:** Atlas Roofing Corporation, Canadian General Tower Ltd., GAF Materials Cooperation, Genflex Roofing Systems, Firestone Building Products Co., IKO industries Canada, Johns Manville Corporation, Sarnafil Ltd, Soprema Canada, Stevens Roofing Systems.

- **Building owners:** Canada Post Corporation, Department of National Defense, Public Works and Government Services Canada and
- **Associations:** Canadian Roofing Contractors' Association, Canadian Sheet Steel Building Institute, Industrial Risk Insurers, National Roofing Contractors Association and the Roof Consultants Institute.

Three payment options were proposed. Option 1: \$7000 due no later than March 2004, \$7000 due no later than March 2005; Option 2: \$5000 due no later than March 2004, \$5000 due no later than March 2005, \$4000 due no later than March 2006; and Option 3: \$14000 due no later than March 2004. Depending on the client selection, invoices will be processed. A signed contract agreement is needed for new members {Carlisle Syntec Incorporated, ITW Buildex and Tremco Inc} to join Phase IV.

Mode of operations and membership benefits: Members have the privileges for first access to the knowledge and technologies developed similar to the previous Phases. The Steering Committee will meet at least twice a year and will consist of all the voting members. Although any member may send, more than one representative, each member will only have one vote. It will be the responsibility of the Steering Committee to develop the research program, establish the project schedule, and set the major milestones for the agreed deliverables. The Steering Committee, through the auspices of the NRC, will prepare and circulate minutes of the Steering Committee and Task Group meetings, and will provide progress reports to its members. Efforts will be made to have summer meeting at the NRC campus in Ottawa and winter meeting together with North American roofing industry related events with the aim to save the travel cost.

Phase IV opening meeting will be held at Tampa Marriott Waterside, Tampa, FL along with ASTM D08 – Roofing Symposium during the week of December 8th, 2003. In the meeting, these draft tasks will be discussed and modified by the Steering Committee. Task Groups can be formed to develop exact deliverables for the Phase IV. Phase IV will be officially launched in June 2004 with the estimated completion of June 2006.

Table 1: Ranking of the Phase IV Objectives by the SIGDERS' Members

Objective #	1	2	3	4	5	6	7	8
Atlas			60		10		30	
CGT	10	60			30			
CPC	40	20			40			
CRCA			70					30
Firestone	50	10			40			
GAF	40	20	40					
Genflex	65	10	25					
IKO			70	30				
NRCA	40		40	20				
PWGSC	60	20			20			
RCI			33		33	34		
Sarnafil	20			40	40			
Soprema	30		30		40			
Stevens	25	25			50			
Tremco	40		30					30
Total	420	165	398	90	303	34	30	60

Objective 1: Influence of deck parameters on the wind uplift resistance of mechanically attached roofs	RANK 1
Objective 2: Effect of table width on the wind uplift resistance of mechanically attached roofs	
Objective 3: Test procedure to quantify air leakage rate of mechanically attached roofs	RANK 2
Objective 4: Test conditions for heat aging of mechanically attached roofs	
Objective 5: Develop correlation for the wind uplift resistance of field/perimeter/corner zones	RANK 3
Objective 6: Develop a procedure to market SIGDERS test method	
Objective 7: Evaluate wind performance of roof assemblies based on cold weather/high RH application	
Objective 8: Investigate the influence of construction defects to mitigate wind uplift damages	